

the test apparatus. The suit is immersed in water for at least two minutes. The suit is then removed from the water and immediately arranged on the test apparatus, using each closure as it would be used by a person wearing the suit. The 135 kg (300 lb.) load is applied for 5 minutes. No part of the suit may tear or break during this test. The suit must not be damaged in any way that would allow water to enter or that would affect the performance of the suit.

(m) *Seam strength.* The strength of each different type of seam used in a suit must be tested under the following conditions and procedures:

(1) *Test equipment.* The following equipment must be used for this test.

(i) A chamber in which air temperature can be kept at 23 °C (73.4 °F) ± 2 °C (1.8 °F) and in which relative humidity can be kept at 50% ± 5 %.

(ii) A device to apply tension to the seam by the means of a pair of top jaws and a pair of bottom jaws. Each set of jaws must grip the material on both sides so that it does not slip when the load is applied.

(2) *Test samples.* Each test sample must consist of two pieces of suit material, each of which is a 100 mm (4 in.) square. The two pieces are joined by a seam as shown in figure 160.171-17(m)(3). For each type of seam, 5 samples are required. Each sample may be cut from the suit or may be prepared specifically for this test. One type of seam is distinguished from another by the type and size of stitch or other joining method used and by the type and thickness of the materials joined at the seam.

(3) *Test procedure.* Each sample is conditioned for at least 40 hours at 23 °C (73.4 °F) ± 2 (1.8 °F) C and 50% ± 5 % relative humidity. Immediately after conditioning, each sample is mounted individually in the tension device as shown in figure 160.171-17(m)(3). The jaws are separated at a rate of 5 mm/second (12 in./minute). The force at rupture is recorded. The average force at rupture must be at least 225 Newtons (50 lb.).

(n) *Tear resistance.* The tear resistance of suit material must be determined by the method described in ASTM D 1004. If more than one material is used, each material must be

tested. If varying thickness of a material are used in the suit, samples representing the thinnest portion of the material must be tested. If multiple layers of a material are used in the suit, samples representing the layer on the exterior of the suit must be tested. Any material which is a composite formed of two or more materials bonded together is considered to be a single material. The average tearing strength of each material must be at least 45 Newtons (10 lb.).

(o) *Abrasion resistance.* The abrasion resistance of each type of suit material on the exterior of the suit must be determined by the method described in Federal Test Method Standard 191, Method 5304.1. If varying thicknesses of exterior suit material are used, samples representing the thinnest portion of the material must be tested. If exterior material has multiple layers, samples of the layer on the outside surface of the suit must be tested. Any exterior material which is a composite formed of two or more layers bonded together is considered to be a single material and the abradant must be applied to the surface that is on the exterior of the suit. The residual breaking strength of each material must be at least 225 Newtons (50 lb.).

(p) *Test for oil resistance.* After all its apertures have been sealed, an immersion suit is immersed under a 100 mm head of diesel oil, grade No. 2-D as defined in ASTM D 975 (incorporated by reference, see §160.171-3) for 24 hours. The surface oil is then wiped off and the immersion suit subjected to the leak test prescribed in §160.171-17(c)(10). The ingress of water must not be greater than 200 grams.

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§ 160.171-19 Approval testing for child size immersion suit.

A child size suit must pass the following tests:

(a) The stability test prescribed in §160.171-17(c)(8), except that only six children need be used as test subjects and they can be of either sex. The subjects must be within the ranges of weight and height prescribed in §160.171-9(m). The heaviest subject must weigh at least 10 kg (22 lb.) more

than the lightest subject. During this test the face seal, neck and chin fit are evaluated and must be comparable to the fit of the corresponding adult size suit on an adult.

(b) The buoyancy test prescribed in § 160.171-17(g).

(c) The body strength test prescribed in § 160.171-17(k) except that the cylinders must be 50 mm (2 in.) in diameter and the test weight must be 55 kg (120 lb.).

§ 160.171-23 Marking.

(a) Each immersion suit must be marked with the words “IMMERSION SUIT—COMPLIES WITH SOLAS 74/83,” the name of the manufacturer, the date of manufacturer, the model, the size, and the Coast Guard approval number.

(b) Each storage case must be marked with the words “immersion suit” and the size.

(c) The markings for the child size immersion suits required under paragraphs (a) and (b) of this section must also include the following statements in print smaller than the word “child”: “(Small Adult Under 50 kg. (110 lb.))”, and “Children Require Adult Assistance for Donning and Use.”

(d) If an auxiliary means of buoyancy is removable and is needed to meet § 160.171-11(a)(2), the marking on the suit must indicate that the suit is not Coast Guard approved unless the auxiliary means of buoyancy is attached.

§ 160.171-25 Production testing.

(a) Immersion suit production testing is conducted under the procedures in this section and subpart 159.007 of this chapter.

(b) One out of every 100 immersion suits produced must be tested as prescribed in § 160.171-17(g) and must be given a complete visual examination. The suit must be selected at random from a production lot of 100 suits and tested by or under the supervision of the independent laboratory. A suit fails this test if—

(1) The measured buoyancy of the suit differs by more than 10% from the measured buoyancy of the suit tested for approval,

(2) The adjusted buoyancy of the suit calculated using the buoyancy loss factor determined during approval testing is less than that required in § 160.171-11(a)(1), or

(3) The visual examination shows that the suit does not conform to the approved design.

(c) If the suit fails to pass the test as prescribed in paragraph (b)(1) or (b)(2) of this section, 10 additional suits from the same lot must be selected at random and subjected to the test. If a defect in the suit is detected upon visual examination, 10 additional suits from the same lot must be selected at random and examined for the defect.

(d) If one or more of the 10 suits fails to pass the test or examination, each suit in the lot must be tested or examined for the defect for which the lot was rejected. Only suits that pass the test or that are free of defects may be sold as Coast Guard approved.

(e) The manufacturer must ensure that the quality control procedure described in the test plans previously submitted for approval under § 159.005-9(a)(5)(iii) is followed.

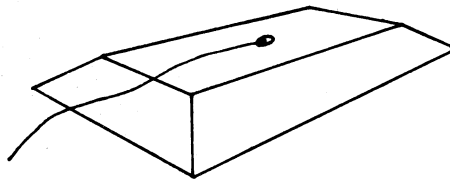


FIGURE 160.171(E)(1)(I). WATER CAN FOR INSULATION TEST